

**REMARKS**

Claims 1 through 74 are currently pending in the application.

Claims 8 through 10, 17 through 22, 25 through 27, 29, 40 through 42, 49 through 54, 61 and 72 through 86 are withdrawn from consideration as being directed to a non-elected invention.

Claims 1 through 7, 11 through 16, 23, 24, 30 through 39, 43 through 48, 55 through 58 and 62 through 71 are rejected.

Claims 28, 59 and 60 are objected to.

This amendment is in response to the Office Action of May 10, 2004.

**Information Disclosure Statement(s)**

Applicants note the filing of an Information Disclosure Statement on March 15, 2004 and note that a copy of the PTO-1449 was not returned with the outstanding Office Action. Applicants respectfully request that the information cited on the PTO-1449 be made of record herein.

**35 U.S.C. § 102(b) Anticipation Rejections**

**Anticipation Rejection Based on Ono et al. (U.S. Patent 3,861,969)**

Claims 1 through 4, 6, 7, 11, 15, 16, 23, 33 through 36, 38, 39, 43, 47, 48, 55 through 57, 65, 66, 70 and 71 are rejected under 35 U.S.C. § 102(b) as being anticipated by Ono et al. (U.S. Patent 3,861,969).

Applicants assert that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Turning to the cited prior art, the Ono et al. reference describes a semiconductor substrate having an Si<sub>3</sub>N<sub>4</sub> layer covered by a phosphosilicate glass layer thereon when formed as a double layer serving as a protective layer and/or mask for selective diffusion to avoid a warping of the substrate. A Zn diffusion layer 45 is formed on the back side of a silicon crystal substrate 31 which is removed therefrom by the lapping of the Zn diffusion layer 45 from the substrate 31.

The Ono et al. reference does not describe, either expressly or inherently, the thinning of the silicon crystal substrate 31 to reduce the thickness thereof to a desired, predetermined thickness but, rather, the removal of the Zn diffusion layer 45.

After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicants have amended the claimed invention to clearly distinguish over the cited prior art.

Applicants assert that the Ono et al. reference does not and cannot anticipate the presently claimed inventions of presently amended independent claims 1, 33, and 5 under 35 U.S.C. § 102 because the Ono et al. reference does not identically describe, either expressly or inherently, each and every element of the presently claimed inventions in as complete detail as is contained in the claims. Specifically, Applicants assert that the Ono et al. reference does not identically describe the elements of the presently claimed inventions of presently amended independent claims 1, 33, and 65 calling for "reducing a cross-section of said semiconductor die by thinning semiconductive material from the back side of the substrate for said semiconductor die" and "reducing a cross-section of said semiconductor die by thinning semiconductive material from said back side thereof".

In contrast to the presently claimed inventions of presently amended independent claims 1, 33, and 65, the Ono et al. reference merely removes a diffusion layer 45 formed on the back side of the substrate 31 but does not thin the substrate 31 to reduce the thickness thereof to a desired, predetermined thickness.

Therefore, presently amended independent claims 1, 33, and 65 are allowable as well as the dependent claims therefrom.

Anticipation Rejection Based on Okuno et al. (U.S. Patent 6,579,748)

Claims 1, 30, 33, 62 and 65 are rejected under 35 U.S.C. § 102(e) as being anticipated by Okuno et al. (U.S. Patent 6,579,748).

Applicants assert that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.

*Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The

identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Turning to the cited prior art, the Okuno et al. reference describes a fabrication method for electronic components 34 on a wafer 10 having a layer of encapsulation material 18 applied to the front side of the wafer having the electronic components 34 thereon thereon causing the wafer to warp requiring an encapsulating resin 40 to be applied to the backside of the wafer 10 after the thinning thereof, the encapsulating resin 40 applied to the back side of the wafer 10 having a contraction stress just sufficient to correct the warping of the electronic component 34 after curing the encapsulation material 18 applied thereto.

After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicants have amended the claimed invention to clearly distinguish over the cited prior art.

Applicants assert that the Okuno et al. reference does not and cannot anticipate the presently claimed inventions of presently amended independent claims 1, 3, and 65 under 5 U.S.C. § 102 because the Okuno et al. reference does not identically describe, either expressly or inherently, each and every element of the presently claimed inventions in as complete detail as is contained in the claims. For instance, the Okuno et al. reference does not identically describe in as complete detail the elements of the presently claimed inventions of presently amended independent claims 1, 33, and 65 calling for "applying a stress-balancing layer to said wafer substantially balancing the stress caused by the front side passivation layer", "applying a rigid stress-balancing layer to a portion of said thinned back side for substantially balancing the stress of the front side passivation layer", and "applying a rigid stress-balancing layer to said thinned back side of the semiconductive material of the wafer under conditions which apply a back side stress generally equivalent to said front side stress of the front side passivation layer upon restoration to conditions of said semiconductor die use".

In contrast to the presently claimed inventions of presently amended independent claims 1, 33, and 65, the Okuno et al. reference creates a stress in the wafer by applying an encapsulation layer 18 to the front side of the wafer 10 and must then apply an encapsulation layer 40 to the back side of the wafer 10. Such is not the presently claimed inventions of

presently amended independent claims 1, 33, and 65. Therefore, presently amended independent claims 1, 33, and 65 are allowable as well as the dependent claims therefrom.

### **35 U.S.C. § 103(a) Obviousness Rejections**

#### Obviousness Rejection Based on Ono et al. (U.S. Patent 3,861,969)

Claims 5, 12, 13, 14, 31, 32, 37, 44 through 46, 63, 64 and 67 through 69 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ono et al. (U.S. Patent 3,861,969).

Applicants respectfully traverse this rejection, as hereinafter set forth.

Applicants further assert that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of the claim limitations. Furthermore, the suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure.

Turning again to the Ono et al. reference, the Ono et al. reference teaches or suggests a semiconductor substrate having an  $\text{Si}_3\text{N}_4$  layer covered by a phosphosilicate glass layer thereon when formed as a double layer serving as a protective layer and/or mask for selective diffusion to avoid a warping of the substrate. A Zn diffusion layer 45 is formed on the back side of a silicon crystal substrate 31 which is removed therefrom by the lapping of the Zn diffusion layer 45 from the substrate 31. The Ono et al. reference does not describe, either expressly or inherently, the thinning of the silicon crystal substrate 31 to reduce the thickness thereof to a desired, predetermined thickness but, rather, the removal of the Zn diffusion layer 45.

After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicants have amended the claimed invention to clearly distinguish over the cited prior art.

Applicants assert that the Ono et al. reference does not and cannot establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the presently amended independent claims 1, 33, and 67 because, at the very least, the Ono et al. reference does not teach or suggest all of

the claim limitations. Specifically, Applicants assert that the Ono et al. reference does not teach or suggest the claim limitations of the presently claimed inventions of presently amended independent claims 1, 33, and 65 calling for “reducing a cross-section of said semiconductor die by thinning semiconductive material from the back side of the substrate for said semiconductor die” and “reducing a cross-section of said semiconductor die by thinning semiconductive material from said back side thereof”.

In contrast to the presently claimed inventions of presently amended independent claims 1, 33, and 65, the Ono et al. reference merely removes a diffusion layer 45 formed on the back side of the substrate 31 but does not thin the substrate 31 to reduce the thickness thereof to a desired, predetermined thickness.

Therefore, presently amended independent claims 1, 33, and 65 are allowable as well as the dependent claims therefrom.

Obviousness Rejection Based on Okuno et al. (U.S. Patent 6,579,748)

Claim 58 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Okuno et al. (U.S. Patent 6,579,748). Applicants respectfully traverse this rejection, as hereinafter set forth.

Applicants again assert that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of the claim limitations. Furthermore, the suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure.

Again turning to the cited prior art, the Okuno et al. reference teaches or suggests a fabrication method for electronic components 34 on a wafer 10 having a layer of encapsulation material 18 applied to the front side of the wafer having the electronic components 34 thereon thereon causing the wafer to warp requiring an encapsulating resin 40 to be applied to the backside of the wafer 10 after the thinning thereof, the encapsulating resin 40 applied to the back

side of the wafer 10 having a contraction stress just sufficient to correct the warping of the electronic component 34 after curing the encapsulation material 18 applied thereto.

After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicants have amended the claimed invention to clearly distinguish over the cited prior art.

Applicants assert that the Okuno et al. reference does not and cannot establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the presently claimed inventions of presently amended independent claims 1, 33, and 65 because the Okuno et al. reference does not teach or suggest all of the claim limitations. For instance, the Okuno et al. reference does not teach or suggest the claim limitations of presently amended independent claims 1, 33, and 65 calling for "applying a stress-balancing layer to said wafer substantially balancing the stress caused by the front side passivation layer", "applying a rigid stress-balancing layer to a portion of said thinned back side for substantially balancing the stress of the front side passivation layer", and "applying a rigid stress-balancing layer to said thinned back side of the semiconductive material of the wafer under conditions which apply a back side stress generally equivalent to said front side stress of the front side passivation layer upon restoration to conditions of said semiconductor die use".

In contrast to the presently claimed inventions of presently amended independent claims 1, 33, and 65, the Okuno et al. reference creates a stress in the wafer by applying an encapsulation layer 18 to the front side of the wafer 10 and must then apply an encapsulation layer 40 to the back side of the wafer 10. Such is not the presently claimed inventions of presently amended independent claims 1, 33, and 65. Therefore, presently amended independent claims 1, 33, and 65 are allowable as well as the dependent claims therefrom.

#### Allowable Subject Matter

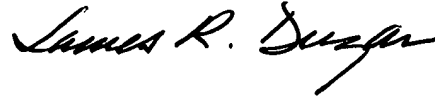
Claims 28, 59 and 60 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants have rewritten dependent claims 28, 59, and 60 as independent claims to include all the limitations of the base claim and any intervening claims from which they depended. Therefore, claims 28, 59, and 60 are allowable.

Applicants consider claims 1, 33, and 65 to be generic, and note that upon allowance of a generic claim, claims 8, 29, and 61 depending therefrom in a non-elected species would also be allowable.

Applicants submit that claims 1 through 7, 11 through 16, 23, 24, 28, 30 through 39, 43 through 48, 55 through 50, and 62 through 71 are clearly allowable over the cited prior art.

Applicants request the allowance of claims 1 through 7, 11 through 16, 23, 24, 28, 30 through 39, 43 through 48, 55 through 50, and 62 through 71 and the case passed for issue.

Respectfully submitted,



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